

# *Field Report*

## Mesa Verde National Park

### ■ 1.0 Summary

Mesa Verde National Park, a collection of archaeological sites on mesa tops and cliff dwellings in deep, narrow canyons, appears to be a strong candidate for expansion of alternate mode transportation systems. As stated by park officials, and as presented on the Mesa Verde web site, the mission of the Park is to preserve and protect the archaeological resources for enjoyment by current and future generations of visitors. It has high levels of summer visitation, and a single roadway route to and from all of its visitor attractions. The access road itself may be eligible for historic designation, yet has many operational and safety deficiencies. Sensitive cultural and archaeological resources make the expansion of the road system undesirable. Three alternative transportation solutions are discussed and compared to a no action alternative. The alternatives range from technology-based traffic and visitor travel management, to shuttle bus systems, to an aerial tramway.

Using these alternatives to supplement or replace auto access could increase the visitor capacity of the Park with concurrent reductions in the personal freedom of park visitors. Two local towns are inextricably linked economically to Mesa Verde, and the greater region's economy is strongly influenced as well. Implementation of any Alternative Transportation System (ATS) would need to be well coordinated with park officials and local governments. Such alternatives would also need to be communicated in advance to the visiting public.



## ■ 2.0 Background Information

### 2.1 Location

Mesa Verde National Park is located in Montezuma County in southwestern Colorado. The Park is accessible from only one entrance, off of U.S. 160, between Cortez and Durango.

### 2.2 Administration and Classification

Mesa Verde is a National Park managed by the NPS. The superintendent of the Park is Larry Wiese.

### 2.3 Physical Description

Mesa Verde NP is a 52,073-acre park (81.3 square miles) comprised of high mesas and deep narrow canyons. The key physical characteristics of the Park that are related to transportation are:

- The only access to the prime visitor attractions of the Park is via a two-lane, winding road with steep curves, 21 miles from the park entrance.
- A 1997 transportation study identified the inconsistency of sign types and the poor condition of some signs as a cause of confusion for motorists.
- Many of the parking areas are near capacity and are projected to reach capacity or exceed their capacity within the next five years.
- The high pedestrian volumes conflict with the tight confines of the circulation and parking around the park headquarters/museum area.
- The narrow roads combined with the size and type of visitors' vehicles makes bicycling difficult and unsafe.
- The need to protect valuable archaeological and cultural resources and the size of the Park makes increasing visitor access, either by expansion of visitor sites or roads, undesirable.

### 2.4 Mission and Goals of the National Park

As stated by park officials, and as presented on the Mesa Verde web site, the mission of the Park is to preserve and protect the archaeological resources for enjoyment by current and future generations of visitors. Established by Congress on June 29, 1906, Mesa Verde

was the first cultural park in the NPS. Mesa Verde National Park was also designated as a World Cultural Heritage Site on September 8, 1978 by UNESCO, an United Nations organization formed to preserve and protect both the cultural and natural heritage of designated international sites.

## 2.5 Visitation Levels and Visitor Profile

Mesa Verde National Park accommodates approximately 700,000 visitors per year, with an average of 62 percent of those visits coming during the summer months of June through August. (Visitation estimates computed from the number of entering vehicles multiplied by 3.2 persons per vehicle.)

Since 1970, the annual number of visitors has fluctuated significantly from year to year, but has seen a steady increase overall (long-term growth rate of 1.5 percent to 2.2 percent per year). Annual visitation peaked at 772,183 in 1988 and has been lower than that in recent years. The lower visitation in recent years has been variously attributed to public fear of the Hanta Virus (announced in 1992), cessation of the Colorado Tourism Board in 1994, federal government shutdowns in late 1995/early 1996, and the Chapin 5 fire in 1996.

Based on visitor surveys conducted in August 1997, the “typical” visitor has the following characteristics:

- Spends only one day at Mesa Verde (75 percent)
- Stays an averages of 5.3 hours in the Park
- Arrives at approximately 10:00 a.m. and stays until about 3:00 p.m.
- Arrives in a party containing two to four people (81 percent)
- Stays overnight one night in the surrounding area (66 percent)

## ■ 3.0 Existing Conditions, Issues, and Concerns

### 3.1 Transportation Conditions, Issues, and Concerns

The main transportation issue at Mesa Verde, *within the constraints of the existing transportation system*, is how to better serve peak demand or how to better spread demand. By 2003, daily visitation in the peak month is expected to exceed the Park’s capacity to handle visitors, meaning that at least some visitors would not be able to see any of the four major Puebloan cliff dwellings during their visit. By 2002, the entrance road is expected to reach capacity during at least some parts of the day. This would result in congestion levels to the degree that traffic jams would become an undesirable part of the visitor experience.

## Visitor Capacity

Based upon the observed visitor flows at both major and minor archaeological sites, the total visitor capacity of the Park is 1,920 visitors per hour or 6,380 per day during the peak summer season. The following table from the 1997 study shows the visitor constraints. (Note the methodology in the 1997 report begins to define, but does not completely substitute for full VERP or other carrying capacity analyses.)

## Roadway Capacity

In terms of the existing roadway system, the most constraining point in the park roadway system is between Morefield Village and Far View. On this segment, the upper threshold for traffic Level of Service (LOS) D is 480 *vehicles* per hour. Taking the NPS assumed average vehicle occupancy at 3.2 persons per vehicle and non-recreational travel into account results in a capacity of approximately 1,500 *visitors* per hour on the roadway, the sum of both directions, or 750 per hour *entering visitors*. In the existing condition, park entrance throughput is slightly below the roadway capacity. Depending upon the growth rate, the roadway capacity will be reached in this location between 2002 and 2008.

**Table 1. Combined Visitor Area Capacity (People)**

	Summer		Shoulder		Winter	
	Hourly	Daily	Hourly	Daily	Hourly	Daily
Ticketed Areas	570	2,890	520	2,370		
Spruce Tree House/Museum	390	3,900	390	3,900	390	3,900
Less 50 percent also visiting Ticketed Areas	N/A	(1,950)	N/A	(1,950)	N/A	(1,950)
Minor Sites		16,814		16,814		15,044
Less visitors also visiting other areas		(15,267)		(15,267)		(14,882)
Visitor Area Total	960	6,387	910	5,867	390	3,112
Roadway Holding Capacity	960		910		390	
Total Park Visitor Capacity	1,920	6,387	1,820	5,867	780	3,112

Source: BRW, Inc., 1997.

## Roadway Information

Improved roadway information could facilitate and expand visitors' experience. The 1997 study reports that during field observations, delays at intersections and wrong-way movements were observed at several locations. Some signs were observed to be in poor condition. The sizes, coloring, and lettering on other signs is inconsistent, hampering visitors' ability to recognize them. Further, the sequence of directional signs is not

consistent throughout the Park, forcing visitors, in some cases, to travel part way through an activity area before they learn what it is.

### ***Parking Capacity***

By 2002, parking demand on both Chapin Mesa and Wetherill Mesa is expected to exceed existing parking capacity during portions of the peak summer season. On Chapin Mesa, the following parking areas are of particular concern: Far View Visitor Center, Far View Archaeological Site, Cedar Tree Tower, Spruce Tree/Museum Lot, and Round Lot. At Wetherill Mesa, both the main lot and the overflow lot are expected to be at 110 percent of capacity by 2002, during the peak summer season.

### ***Transit Utilization***

Mesa Verde currently has two forms of mass transit operating on site. One is a fee-based bus tour of the Park, operated by the park concessionaire. The other is a fee-based rubber-tire tram operated at the end of Wetherill Mesa. The former system has had low utilization relative to the total visitation at the Park. The tram system has had higher utilization, being required for those who want to see Long House. The tram system has also experienced maintenance problems in recent years due to an aging vehicle fleet.

### ***Bicycle Safety***

The Park's policy towards bicycling has varied over the last decade. Policy changes coupled with lack of signage for bicyclists causes confusion. The result of this confusion has been observed via bicycle-vehicle conflicts. Several accidents have been recorded in the tunnel, a location where bicycles are prohibited because of poor lighting and inadequate lane widths.

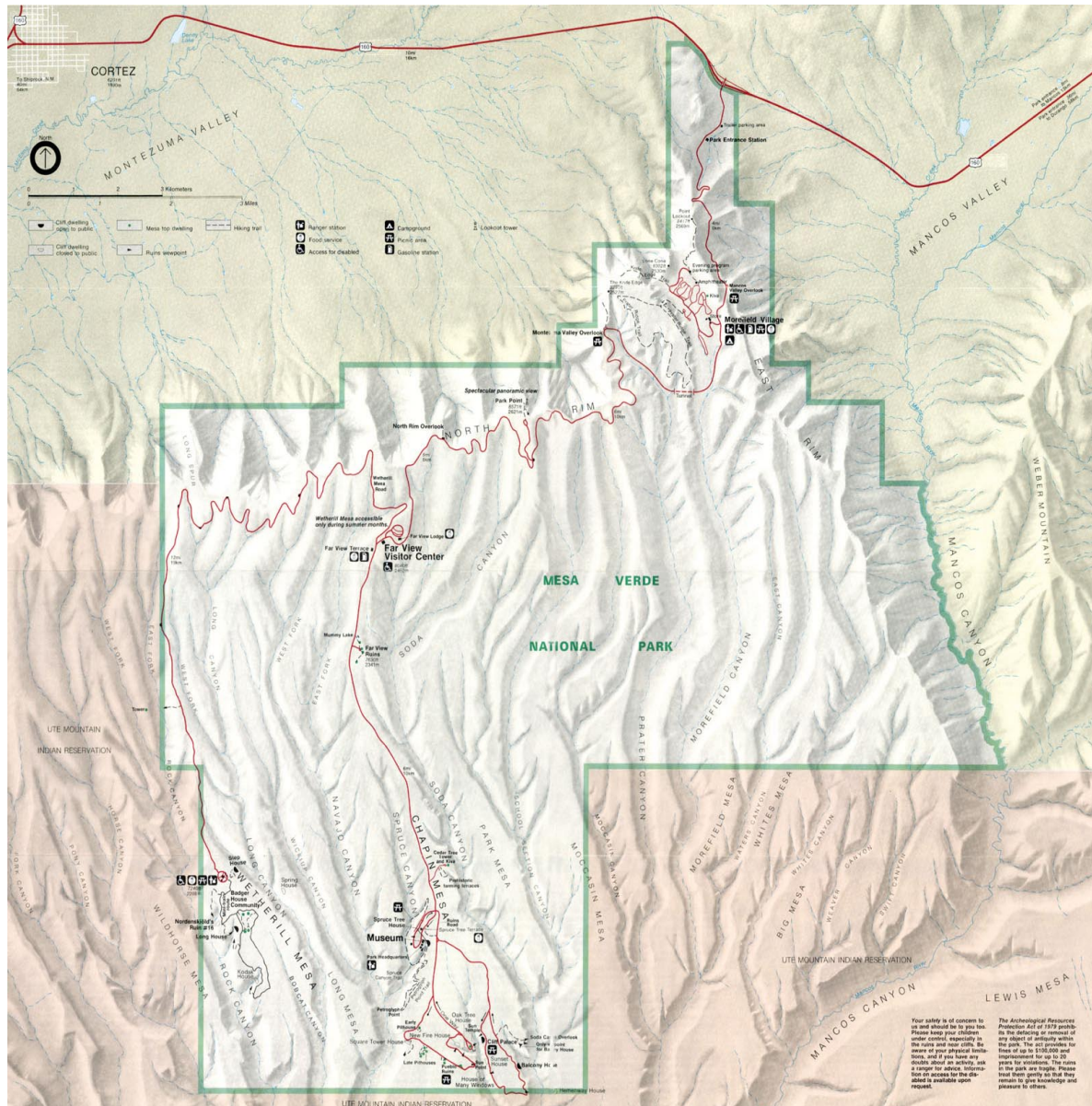
### ***Pedestrian Safety***

There is an identified need for improved pedestrian accommodation along the one-way roadway between "four-way" (the only four-way intersection in the Park) and Spruce Tree House. During times of heavy demand at the Visitor Center, parking extends northerly along the one-way road. Without a sidewalk or path, people going from their cars to the Visitor Center (and in the opposite direction) walk in the road, creating a safety hazard.

## **3.2 Community Development Conditions, Issues, and Concerns**

The economy of southwestern Colorado is heavily dependent upon tourism, the mainstay of which is Mesa Verde. The regional planning agency for the area, Region 9, estimates that tourism accounts for approximately 30 percent of the region's economy of five counties. Montezuma County's economy, where Mesa Verde is located, may be influenced even more by tourism.

**Figure 1. Map of Mesa Verde National Park**





## **Parking at Wetherill Mesa**



## **Tram at End of Wetherill Mesa**



In recent years, there have been proposals to develop a bus shuttle system, cultural center, and/or an aerial tramway. The aerial tram is the rebirth of an idea first proposed in the 1970s. All three proposals are the subject of much discussion, particularly in the Park, the adjacent towns of Cortez and Mancos, and the Ute Mountain Ute Reservation to the south of the Park. Both towns and the Ute community are vying for any such investment which would create a new focal point for visitor entrance into the Park. The Park would like to

work with local towns and Utes, but has a policy proviso which prohibits the creation of “windfall” benefits for private interests.

Another identified concern is the need for on-site housing for park staff, concessionaire staff, and other support service personnel. Approximately one-third of park staff are housed on site. None of the concessionaire staff or other support personnel are housed on site. This means up to 200 employees commute 50 or more miles each way on a daily basis. The result is increased traffic, increased air pollution, and lost productivity (on the job or with families). Formal and informal car-pooling is already in place, but the shifts and diverse trip origins make this option ineffective.

### **3.3 Natural or Cultural Resource Conditions, Issues, and Concerns**

The natural resource issues related to transportation are:

- It costs approximately \$500,000 per year to maintain the existing road system and clean up after rock falls or mudslides associated with unstable soils.
- After the 1996 fire stripped the land of covering vegetation, park officials discovered that there were twice as many archaeological sites as previously believed.
- Proposed expansions of the transportation system have run into one of several major hurdles: actual disturbance of archaeological sites (i.e., from road widening), visual disturbance of the landscape (i.e., from proposed aerial tramway), or noise intrusion (i.e., from expansion of bus shuttle system).
- From the cultural preservation standpoint, the original argument for opening Wetherill Mesa to visitors was to “split” the crowding of visitors into two locations. In reality, however, many visitors now expect to see cliff dwellings on both Mesas.
- The park road from the entrance to Far View may be eligible for historic designation.

### **3.4 Recreation Conditions, Issues, and Concerns**

Mesa Verde NP staff have identified the following recreation concerns related to transportation:

- Need to better accommodate and manage backcountry access to the Park, which could potentially affect vehicular, bicycle, and pedestrian patterns.
- The need to have additional museum exhibition and curatorial storage space for artifacts. If a new facility is built, the transportation patterns could change and the relationship to the nearby Anasazi Heritage Center would need to be defined. If the existing facility is expanded, additional parking might be required.



### **3.5 Tribal Issues**

Native American Graves Protection and Repatriation Act (NAGPRA) consultation is an ongoing process for area tribes and park staff. Human remains and associated funerary artifacts are subject to repatriation consultation involving 24 Indian tribes from the area. The NAGPRA consultation process brings interested tribes from the area together at least once a year to participate in repatriation affairs specifically covered by the Act. The consultation process also includes reviews of Park museum displays and management activities. Museum displays have been recently modified due to implementation of NAGPRA by the removal of certain artifacts. The Mesa Verde Park was formerly part of the Ute Mountain Ute Indian Reservation, until 1906 when Congress approved a land exchange with the Ute Tribe, taking the ruins into federal ownership.

Any alternative transportation plans need to be submitted, reviewed and official comments taken from all tribes on the consultation list. The consultation process attempts to include all area tribes who have a possible historic claim to the area or remains. A common tribal concern is expansion of public visitation of ruin and burial areas not currently developed. The tribes involved feel the ruins should be left as they are in a non-excavated state, and new areas need not be disturbed. Tribal officials do not favor expanding public visitation to other sites in the area or to develop new ruin areas for public visitation. The tribes feel that the natural erosional forces should be allowed to continue and sites not actively preserved or restored. Excavations for investigative or data collection activities are not desired.

Native Americans are allowed access to the Park at no charge if they declare their visit is for the purpose of religious practice. Park staff state this use is low, and could be associated with individuals reluctance to declare their visit as religious. Plant collecting for use in native ceremonies is conducted on the Mesa Verde site. Some tribal officials have expressed support for the construction of a new visitation and museum at the entrance of Mesa Verde. The center would have an area for special tribal displays on a rotational basis so all associated tribes would have an opportunity to provide a display at the center. The center located at the entrance may reduce some of the current traffic from entering the Mesa Verde area. Also, some officials expressed support for ATS such as trams. Trams may provide a more direct access route to the actual ruins instead of traversing the several miles of existing road, and provides opportunity for better control on the visiting public. A tribal official indicated that future construction activities need to be limited to existing disturbed areas. Other alternative transportation modes within the Park such as trails and bikeways are of concern to tribal officials. The unsupervised nature of such travel increases the likelihood of the public entering non-disturbed ruin areas, people leaving Mesa Verde and entering Ute tribal lands, and the increased possibility of vandalism, theft and injury.

Surrounding lands on the east, west and south are owned by the Ute Mountain Ute Tribe, headquartered in Towaoc Colorado. The Tribes manage the areas adjacent Mesa Verde as a Tribal park to preserve the archeological remains as they exist today. Trespass onto Tribal lands from Mesa Verde lands has occurred in the past and is a concern with Tribal Park staff. The concern lies with protection of archeological ruins on tribal land and with the safety of trespassers, as the Tribal Park is primitive in nature. Current management policy is to maintain everything within the interior of the Tribal Park primitive and non-

developed. The interior is considered to be everything east of Highway 666. A future planned Ute Cultural Center and commercial development centers around the current casino and tribal camp areas. Any consideration for an alternative access or transportation options centering near the Ute Tribal Headquarters needs to be addressed to the Ute Mountain Ute Tribal government.

## ■ 4.0 Planning and Coordination

### 4.1 Unit Plans

Two separate planning studies have been released in the last two years. The first, released in 1997, promoted shuttle bus options as a means of addressing visitor demand issues without making any changes to the existing transportation system. That plan analyzed four alternatives, but withheld a recommendation pending policy decisions being made by park staff regarding the balance between accommodation of unlimited numbers of visitors or placing restrictions on the numbers to protect the visitor experience.

The second study, released in 1999 by the University of Denver Business School, promoted aerial tramway transportation as a viable business enterprise for the Park. Not only was this option determined to be financially feasible, but it would also increase visitor access without increasing actual access.

Mesa Verde staff are considering additional studies to reconcile the differences in these studies. They are considering conducting an environmental impact statement or an analysis of the two studies as a means of answering this question.

### 4.2 Public and Agency Coordination

Mesa Verde has had some informal agency coordination via regional and local planning studies. The Southwest Colorado 2020 Transportation Plan process has referenced Mesa Verde in its work, related to cultural preservation.

The Montezuma County Department of Economic Development is another forum for public and agency coordination. All of the local communities participate in discussions about economic development and tourism.

If and when an Environmental Impact Statement goes forward on the variously recommended transportation alternatives, both public and agency coordination would be required. Consensus on a single direction clearly has not been reached. It will be important to make this decision in the near future (within the next five years).

## ■ 5.0 Assessment of Need

### 5.1 Magnitude of Need

The need for an ATS at Mesa Verde is substantial. The number of people who can visit Mesa Verde is primarily limited by the archaeological sites themselves, and secondarily by the existing transportation system. Without transportation system improvements, the Park will either have to limit visitation to preserve the visitor experience or sacrifice the quality of the experience to accommodate more people. Under the second alternative, preservation of the cultural resources might also be at stake.

### 5.2 Feasible Alternatives

There are several feasible ATS options available to Mesa Verde. These transportation alternatives were identified previously in 1997 and 1999 studies. All of the alternatives below assume that no additional archaeological sites would be opened to visitors.

**No Action.** The objective of this alternative is to minimize costs by maintaining the existing visitor facilities. Visitor access will be controlled at the existing gate to prevent overcrowding and protect the cultural & natural resources.

Annual Road Maintenance Cost (\$1,999): \$0.5 million or 0

20-Year Cost (\$1,999): \$10.0 million or 0

1. **Visitor Demand Management** – The objective of this alternative is to shift the time each visitor spends in the Park and reduce the maximum accumulation of visitors through the use of a reservation system, control of visitor access, and real-time advanced visitor information. Through the use of management techniques, aided by small capital investments in infrastructure, the congestion experienced by people as they move through the Park can be significantly reduced.

- Annual Road Maintenance Cost (\$1,999): \$0.5 million or 0

- Capital Investment Cost (\$1,999): \$1.2 million or 0

(Assumes four variable message signs, four metering-type loop detectors and signals, and additional turn lanes w/ 20+ year lifespan)

- Annual O&M Costs of Capital Investment: \$0.1 million

- 20-Year Cost (\$1,999): \$13.2 million or 3.2 million

2. **Mandatory Shuttle Bus System** – The objective of this alternative is to maximize visitor capacity by intensively managing visitation. Capacity would be maximized by limiting each visitor access to only one major site per day, while affording the opportunity to see minor sites in the immediate vicinity of the major site. The “major sites”

are as follows: Cliff Palace, Balcony House, Spruce Tree House, and Long House. All visitors would be transported by bus mass transit from a Cultural Center to one of the major sites. A new Cultural Center facility is assumed near the current entrance, but closer to Highway 160. The mass transit system would operate only during the peak months of June through August. In the other months of the year, the strategies in Alternative 2 would be implemented. Bus transit routing and frequency would be coordinated with and limited by the capacity of the visitor attractions.

- Annual Road Maintenance Cost (\$1,999): \$0.5 million or 0
- Capital Investment Cost (\$1,999): \$10.5 million  
(Assumes 42 buses @ \$250 K ea., w/ 15-year life span if used only seasonally)
- Annual O&M Costs of Capital Investment: \$1.4 million  
(Assumes 38 buses, operating eight hours each per day, 92 summer days, \$50/hr per bus)
- 20-Year Cost (\$1,999): \$59.0 million or 49.0 million  
(Assumes initial purchase + one fleet replacement in 20 years)

3. **Aerial Tramway** – The objective of this alternative, like the shuttle bus system, is to maximize visitor capacity in the Park. In this case, visitor capacity would be maximized by opening *visual access* to more of the Park’s resources without allowing actual (pedestrian) access. Aerial trams, in the form of enclosed cabins, would transport visitors from an entry point or points to the top of the mesa. From the mesa top, additional or connecting aerial trams would take visitors down through the narrow canyons containing cliff dwellings. Based upon available information, this alternative is in the conceptual stage and no operating base location has been selected. Road access would be retained for maintenance and service vehicles.

- Annual Road Maintenance Cost (\$1,999): \$0.5 million or 0
- Capital Investment Cost (\$1,999): \$93.0 million  
(Assumes 10 miles of aerial tramway towers & cables @ \$9.0 M/mile, 100 cabins @ \$30K each)
- Annual O&M Costs of Capital Investment: \$0.3 million  
(Assumes eight hours operation per day, 92 summer days, \$400/hr)
- 20-Year Cost (\$1,999): \$109.0 million or 99 million  
(Assumes initial purchase, no cabin replacement over 20 years)

## ■ 6.0 Bibliography

“Bicycling in Mesa Verde Country.” <http://www.swcolo.org/Tourism/Recreation/>. Data printed August 13, 1999.

BRW, Inc.; Lee Engineering; and TRA Inc., Mesa Verde National Park Transportation Study, Draft. December 1997.

Memorandum from Francine Patterson to Don Shepherd. “MEVE Transportation Emissions.” May 27, 1999.

Mesa Verde National Park. “Monthly Public Use Report, Form 10-157.” Year-to-date Visitation, July 1999.

Mesa Verde Museum Association, Inc. “Badger House Community: Trail Guide.” Undated.

Mesa Verde Museum Association, Inc. “Nordenskiöld Ruin No. 16.” Undated.

Mesa Verde Museum Association, Inc., Mesa Verde National Park, and ARAMARK. “Visitor Guide.” Summer 1999.

Mesa Verde National Park. “Long House Trail Guide.” Undated.

National Park Service. “Mesa Verde National Park.” <http://www.nps.gov/meve/>. Data printed August 13, 1999.

National Park Service. “Mesa Verde National Park Colorado.” Map. GPO: 995-387-038/00213, Reprint 1995.

National Park Service and National Park Foundation. “Our Fragile Legacy: Preserving the Spirit of Peoples Past and Present.”

Recreation.Gov. “Mesa Verde National Park.” <http://www.recreation.gov>. Data printed August 13, 1999.

Southwest Colorado Regional Planning Commission and DMJM. *The Southwest Colorado 2020 Transportation Plan: DRAFT*. August 1, 1999.

“Tram Proposed at Mesa Verde: Futuristic Options Could Supersede Pre-Columbian Park Setting.” *NPCA Park News*: pp. 20-22, May/June 1999.

Ute Mountain Utes. “Ute Mountain Tribal Park: Awaken Your Spirit.” Towaoc, Colorado. Undated.



## ■ 7.0 Persons Interviewed

Ed Morlan, Executive Director of Region 9. Wednesday, August 18, 1999

Hal Sheppard, City Manger, City of Cortez. Monday, August 16, 1999

Patty Trap, Planner for Mesa Verde. Tuesday, August 17, 1999